Article

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Should Consultation Recording Use be a Practice Standard? A Systematic Review of the Effectiveness and Implementation of Consultation Recordings

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Abstract

Objective: To conduct a systematic review of the effectiveness of consultation recordings, and identify factors contributing to their successful implementation in healthcare settings.
Methods: A systematic review was conducted for quantitative studies examining the effectiveness of consultation recordings in healthcare. Two independent reviewers assessed the relevance and quality of retrieved quantitative studies using standardized criteria. Study findings were examined to determine consultation recording effectiveness and to identify barriers and facilitators to implementation. A supplementary review of qualitative evidence was performed to further explicate implementation factors.
Results: Of the 3,373 articles retrieved in the quantitative search, 26 satisfied the standardized inclusion criteria (12 randomized controlled trials, 1 quasi-experiment, and 13 cross-sectional studies). The majority of patients found consultation recordings beneficial. Statistically significant evidentiary support was found for the beneficial impact of consultation recordings on the following patient reported outcomes: knowledge, perception of being informed, information recall, decision-making factors, anxiety, and depression. Implementation barriers included strength of evidence concerns, patient distress, impact of the recording on consultation quality, clinic procedures, medico-legal issues, and resource costs. Facilitators included comfort with being recorded, clinical champions, legal strategies, efficient recording procedures, and a positive consultation recording experience.
Conclusions: Consultation recordings are valuable to patients and positively associated with patient reported outcomes. Successful integration of consultation recording use into clinical practice requires an administratively supported, systematic approach to addressing implementation factors.

Background

Patients commonly seek detailed diagnostic and treatment information to gain a fuller understanding of their disease and its management.[1, 2] Patients can be overwhelmed, however, by the complexity of information provided during healthcare consultations.[3] Elevated levels of anxiety may hinder efforts to process and retain information imparted during these consultations,[4] making it difficult to remember.[5, 6]

The most recent Cochrane review, conducted almost one decade ago, concluded that consultation recordings in oncology "may benefit most adults with cancer…most patients find them very useful".[5 p.2] The Cochrane review also identified further questions worth exploring, many of which have been the focus of subsequent research studies that have not been subjected to systematic review. Providing patients with audio-recordings of important consultations can reduce their anxiety, improve recall of information, and enhance their perception that they have been adequately informed about their disease and treatment.[5-9] **Recordings** enable greater patient participation in decisions surrounding disease management, reduce treatment decision regret, and facilitate patient satisfaction with care.[4, 5, 7, 8, 10] Despite the established benefits of **recordings**, use of this intervention in clinical practice is sporadic.

The provision of recordings of key consultations is topical and controversial. While some researchers and patient advocacy groups have argued for its routine use in clinical practice, many clinicians are hesitant to record consultations fearing litigation.[11] Many believe the evidence base is mixed and inconclusive, while others believe the resources required to implement the intervention preclude its use in standard care.[12] If implementation barriers are perceived to be strong enough to preclude implementation of an empirically validated intervention, then these barriers need to be remedied. The objectives of the present review were to: 1) Conduct a systematic review of the

effectiveness of **consultation recording** use; and 2) Review the **consultation recording** literature to identify key implementation factors and the best ways to address them.

Methods

Review Objective One

Inclusion and exclusion criteria. To be included, studies had to involve adults or children having a clinical consultation in a healthcare setting, after which the patient or family received a **consultation recording** (tape or digital). Primary quantitative study designs eligible for inclusion were randomized controlled trials (RCTs), quasi-experimental studies (QE), analytical cross-sectional (observational) studies, and descriptive cross-sectional studies. Studies from all countries were considered if they were written in English. We excluded studies that investigated written summaries or video recordings of consultations alone, did not provide the **recording** to the patient, or examined the use of standardized audio-recorded education materials. An a priori systematic review protocol guided this work. Research ethics board approval was not required for this systematic review.

Search strategy, study selection, and analysis. Online databases including MEDLINE, CINAHL, PsychINFO, EMBASE, Web of Science, Sociological Abstracts, and ProQuest Dissertations & Theses were systematically searched from January 1, 2002, to August 30, 2016 (see supporting information Table S1). A grey literature search was conducted of Conference Proceedings Citation Index, Grey Matters, Google Scholar, and relevant websites. Two independent reviewers (KR, TH) screened titles/abstracts of retrieved articles for potential inclusion criteria and one reviewer read the full-text of relevant articles to confirm eligibility. Two independent reviewers (KR, TH) critically assessed eligible RCTs with two widely used quality appraisal tools: the Joanna Briggs Institute (JBI) Critical Appraisal Tool for Randomized Controlled Trials[13] and the Effective Public Health Practice Project Quality Assessment Tool for Quantitative Studies (EPHPP).[14] Quasi-

experimental studies were assessed by two reviewers (KR, TH) with the JBI Critical Appraisal Tool for Quasi-Experimental Studies.[15] To be included in the review, an RCT or quasi-experimental study had to meet key criteria determined by two reviewers (see supporting information Table S2). Disagreements were resolved through discussion between the two reviewers. The PRISMA statement for reporting systematic reviews was utilized to frame the search and study selection process.[16] The heterogeneity of the samples, methods, and outcomes in the reviewed studies precluded a meta-analysis; therefore, the extracted data was analyzed using a narrative synthesis.

Review Objective Two

In addition to the descriptive findings and narrative comments contained within the quantitative papers from the first objective, a systematic review of the qualitative literature was conducted using terms associated with healthcare consultations, consultation recordings, and qualitative research.[17] (see supporting information Table S1) MEDLINE, CINAHL, and the grey literature were searched from January 1, 2002, to February 5, 2017. Two reviewers screened retrieved titles/abstracts for relevance (KR, TH), and all qualitative designs were included. Only data addressing the barriers and facilitators contributing to the successful implementation of **recordings** were extracted and thematically analyzed from the included quantitative and qualitative studies.

Results

Quantitative Studies for Inclusion

The database search for objective one retrieved 3359 articles, and an additional 14 articles were retrieved through searching the grey literature, reference lists, and Scopus using the forward search function (see Figure 1). After removing duplicates (n=1374), 1999 titles/abstracts were examined and 1911 articles were excluded for not meeting the inclusion criteria. The full texts of the remaining articles (n=88) were reviewed in-depth, and a further 61 articles were excluded.

Reasons for exclusion are provided in Figure 1. After critically appraising the RCT and QE studies, 12 RCTs, 1 QE study, and 13 cross-sectional descriptive (CS) studies were included. One RCT was excluded as it did not meet our quality criteria.[18]

Description and Quality Appraisal of Quantitative Studies

The majority of studies (see supporting information Table S3 for study details) examined **consultation recordings** for patients with cancer (n=19).[1-3, 8, 9, 19-32] Some unique oncology contexts included patients transitioning from curative to palliative care,[8] parents of children with leukemia having an initial consultation,[25] and migrant patients with cancer who requested an interpreter.[22] Three studies examined the usefulness of **recordings** for enhancing informed consent.[4, 20, 21] The remaining seven studies occurred outside of the oncology context.[4, 10, 33-37] The geographical settings included the United Kingdom, [2, 4, 10, 26, 28-30, 33, 34] United States,[1, 19, 24, 32, 36] Canada,[9, 21, 27, 31] Australia,[3, 22, 23, 37] Sweden,[20] The Netherlands,[8] Italy,[25] and Denmark.[35] Supporting information table S2 summarizes the RCT and QE quality appraisals. On the JBI checklist,[13] 11 RCTs received 8-13 out of a possible 13 points, and one received 5-7 points. On the EPHPP tool,[14] five RCTs received a strong global rating, five received a moderate rating, and two received a weak rating. The one QE[26] study received seven out of nine points on the JBI QE tool.[15]

Description of Qualitative Studies

In addition to the descriptive data and narrative comments from the quantitative studies, 12 qualitative studies were included to answer the second review objective. These qualitative studies were identified when screening titles/abstracts for objective one or found in the 92 articles retrieved in the systematic search for objective two. Studies explored patients' experiences/perspectives of **consultation recording**[26, 31, 34, 36, 38-42] and healthcare professionals' experiences of **consultation recording** implementation.[12, 31, 34, 36, 40, 43, 44] The qualitative studies took place in the United States,[36, 38, 40, 43, 44] UK, [26, 34, 39, 41, 42] Canada,[31] and Australia.[12]

Objective One: Effectiveness of Consultation Recordings

Satisfaction. Patients had an overall positive perspective of **consultation recordings**. Sixteen studies (7 RCTs, 9 CS) reported that the majority of participants found **recordings** useful or beneficial, with a range of 55-98% across studies.[1-3, 8, 10, 20, 22-25, 28-30, 34, 36, 37] However, listening to the **recording** was distressing (3-18%)[2, 20, 29] or a source of anxiety (19-26.8%)[3, 25] for small proportions of participants. In one study, participants had a marginally significant preference for **consultation recordings** over standardized audio-recordings.[21] In another study, 17 (57%) patients preferred to receive both a **recording** and summary letter, 7 preferred the audio-recording alone, and 3 preferred the letter alone, with participants more likely to give the **recording** (69%) to a family member or friend than the letter (50%).[3] Five RCTs examined if **recordings** had an impact on the patients' satisfaction with communication with the health provider, but none found significant differences.[9, 21, 23, 27, 37]

Use of consultation recordings. Most studies reported that the majority of participants (51-100%) listened to their **recordings**,[2-4, 8-10, 19, 20, 22-25, 27-29, 31-34, 37] although one study found that only 31% of participants listened.[35] Some participants listened more than once, with an average use of 1.3 to 3.0 times.[9, 10, 21, 25-28, 30, 31] Reasons cited for not listening included technological issues,[26, 31, 35] not wanting to revisit their decision,[26] feeling they had received sufficient information already,[3, 26, 29, 31] worrying it would evoke negative emotions,[20, 29] intending the **recording** for a family member,[29] being overwhelmed or too busy,[31, 34] desiring to move on,[3, 31] preferring another modality,[31] feeling too sick,[31] disliking the sound of their voice,[34] and lacking the privacy to listen to the **recording**.[34] When patients were prompted to record their own consultations, one study found that only 20% did so.[32] Between 20 and 100% of participants in 14 studies reported that they shared their **recording** with others.[1-3, 8-10, 19, 20, 22, 23, 27, 29, 31, 32] Patients shared their **recording** with spouses/partners, children, family members, friends, and doctors. A number of factors were

associated with using the **recording** including increased anxiety,[23] being married,[3] receiving bad news,[3] having longer consultations,[3] increasing age,[35] and gender (female patients and their relatives replaying together; relatives of male patients replaying alone).[35]

Knowledge, perception of being informed, and recall of information. Nine (75.0%) RCTs assessed the impact of **recordings** on knowledge, perception of being informed, or recall of information, and five found significant positive results. Of the four RCTs specifically measuring knowledge, three investigated knowledge relevant to enhancing informed consent[4, 20, 21] and only one demonstrated significant findings.[4] Two[9, 27] of the three[9, 21, 27] studies examining patients' perception of being informed, and two[2, 37] of the three[2, 33, 37] studies measuring recall, showed that the **recording** provided significant benefit.

Psychological health and well-being. Seven (58.3%) RCTs measured anxiety, depression, and/or stress,[2, 4, 10, 23, 30, 33, 37] and significant differences were observed in three studies. In two studies, **recordings** significantly reduced participants' anxiety[4, 33] and in one study it reduced their depression.[4] Another RCT found significant decreases in anxiety and depression when the analysis was repeated with only those who had listened to the recording.[23] There were no other RCTs that reported a statistically significant impact of **recordings** on psychological adjustment,[9, 27, 30] quality of life,[8, 9, 27] treatment adherence,[10] or openness to discussing cancer-related issues in the family.[8]

Decision making. Of the three studies assessing the impact of **consultation recordings** on concepts associated with decision making, all had significant findings. One study found significantly higher decisional self-efficacy,[30] and two found lower decisional regret,[26, 30] for those who had received a recording. In the QE study, receiving a **recording** was positively associated with less decision regret, and was even a stronger predictor of decision regret than erectile dysfunction or incontinence.[26] Another RCT measured health locus of control, and found that the

consultation recording group reported a significantly higher sense of control regarding their own health than the control and standardized recording groups.[4]

Objective Two: Barriers and Facilitators to Consultation Recording

The synthesis for the second question revealed noteworthy individual, interpersonal, and system barriers to implementing **consultation recordings,** as well as critical facilitators.[12]

Perceived value of consultation recording and the evidence. The qualitative findings showed that both patients and practitioners valued **consultation recordings**.[12, 31, 36, 39, 42] Patients appreciated **recordings** for the purposes of enhancing patient-centred communication and fostering empowerment.[39] Some practitioners questioned whether **recordings** benefited those with a passive decision making style.[12] Healthcare professionals had differing assessments of the empirical evidence on **recordings**, with the majority being unaware of the supporting evidence base.[12, 31] The provision of high quality, accessible evidence such as systematic reviews and clinical practice guidelines was identified as an essential facilitator to ensuring staff were adequately informed, and promoting practice change.[31]

Clinician's motivation. Positive feedback motivated clinicians to continue with **recordings**. Piloting and evaluating **consultation recording** was identified as a means by which to promote the "buy-in" of stakeholders and to inspire routine implementation,[12] through exposure to **the** benefits.[29, 40, 43] One study offered a feedback letter to oncologists espousing the patient-reported benefits of **recordings** to reinforce the importance of continuing the practice.[31]

Fear of distressing patients. Clearly identified barriers included concerns that **recordings** could increase patients' anxiety when replaying distressing content or impose an undesired active decision-making role on patients.[2, 12, 29] Practitioners noted that certain visits might not be wholly appropriate for **recording,** such as consultations in which bad news was given, the patient became upset, or the patient was extremely anxious.[12, 29]

Impact on the consultation. Variation in perspectives regarding the impact of **recording** on the consultation determined whether this factor was a barrier or facilitator. Some healthcare workers reported feeling anxious or self-conscious about what they said when being recorded as well as concerned that the **recording** would make the communication more formal, factual, or structured.[12, 20, 29] Practitioners noted that consultations are not always a straightforward provision of information and that a desire to create a coherent recording could be a barrier.[12] In contrast, others felt at ease with being recorded[40] or thought that more detailed information was given with **recordings**.[29] Some patients thought the intervention might violate the traditional etiquette of the doctor-patient relationship; thus, challenging the clinicians' status or damaging the relationship.[39] Others believed that the **recording** process would not hinder physicians from sharing information, might increase their accountability, and could enhance respect for clinicians who were willing to be recorded.[39]

Clinical champions. An essential facilitator of successful implementation was leadership, that is, an identified, respected champion with the administrative or social power to advocate for the intervention, and obtain necessary funds and staff resources for a **consultation recording** program.[31] Support from physicians conducting the consultations was crucial for successful implementation, as was their consistency in following the **recording** procedures.[44]

Legal and privacy concerns. There was evidence that legal and privacy concerns were substantial barriers to **recordings**. Physicians were concerned about medico-legal implications, such as who owns the recording, whether the treatment center should retain a copy, how to store the **recordings** within existing medical records, if the recording might be used in a lawsuit, and with whom the recording would be shared.[12, 29, 31] There were also concerns about a breach of confidentiality if the consultation was shared without permission, and a loss of control of the recording if it was posted on the internet.[1, 34, 39] An important facilitator was assuring that legal

requirements were met.[12] One strategy involved creating a disclosure/consent form for patients, providers, and the organization, and ensuring the consent process communicated the patients' and providers' rights, obligations, and the appropriate forms of distribution for the **recording**.[12] One center created a disclaimer which clearly stated that the **recording** had not been reviewed by physicians, could contain errors or omissions, and that it was primarily for the convenience and personal use of patients.[43]

Required resources and technology. There were reservations about the amount of time that **recordings** might require in an already overloaded clinical setting.[12, 24, 36, 43] However, researchers reported that **recordings** did not substantially increase the length of consultations,[1, 9, 10, 24, 29] and some even found it was an efficient means of promoting the doctor-patient partnership.[10, 12, 34] Intervention and resource costs were identified as other primary barriers to the sustainable implementation of **recordings.**[12, 31, 36, 40] One cost-saving facilitator was integrating **recording** procedures into existing staff roles.[40] Technology was highlighted as a facilitator when no significant technical problems occurred,[8] and as a barrier when malfunctioning or inaccessible equipment hindered the intervention.[9, 10, 22, 29, 34, 37] Researchers cited poor recording quality as a barrier to use.[3, 8, 24, 26, 34] With an array of recording options, selecting the most appropriate **recording** technology for the target patient population was an important consideration.[34, 41] The growing accessibility of smartphones for self-recording of consultations was acknowledged as holding potential for facilitating **recordings.**[12, 39]

Logistics and procedures. Logistical facilitators included **recordings** posing a minimal burden to the clinical environment and embedding **recordings** into usual care.[12] Clear procedures and staff support were critical to preventing problems with **recordings** and avoiding increased consultation time.[8, 12] Significant logistical components of supporting **recordings** included organized scheduling, informing patients of the benefits of **recordings** and their option to record,

ensuring the recording equipment was functioning properly, obtaining consent to record, ensuring the recording occurred despite time pressures, and delivering the recording to the patient.[12, 24, 31, 38, 43] To address concerns of **recordings** causing distress, patients should be offered the choice of receiving a **recording** rather than systematically providing one to all patients.[12] To avoid covert self-recordings, procedures should be in place to allow patients to record their own consultations.[12, 39]

Conclusions

This systematic review builds upon previous work by including the most recent literature and elucidating the barriers and facilitators of routine implementation. The findings demonstrate that **consultation recordings** enhance decision-making and patient satisfaction, and that patients frequently listen to their recordings and share them with others. Although patients derive benefits from **recordings,** there were equivocal findings regarding knowledge, information recall, the perception of being informed, and psychological well-being.

Only a proportion of the studies reported significant results for anxiety and depression. It may be unreasonable to expect patients' psychological well-being to be significantly improved by a recording only a short time after a life-altering diagnosis.[9] There was also variation in patients' perceptions of recordings and identified factors that contributed to their use. Recordings may also resonate more with certain individuals depending on their preferred coping mechanisms. If patients prefer to use denial as a coping mechanism, recordings may not be valuable to them, and may actually cause anxiety.[6]

The findings of this present review had notable differences with the earlier Cochrane review[5] A distinct finding, which was only evident in this review, was that **recordings** had an unequivocally positive impact on concepts associated with decision making. Lower decision regret

may be a result of **consultation recordings** enhancing patients' understanding of the risks, benefits, and outcomes of various treatments, all contributing to more fully informed decision making.[26]

This review also extended the Cochrane review by identifying key implementation factors and strategies to address them. Barriers to implementation of **recordings** included a lack of awareness of the empirical evidence on **recordings,** feeling self-conscious about being recorded, perceptions that the recording process will negatively impact the consultation, variation in physician cooperation with **recording** procedures, lack of staff and financial resources, and medico-legal concerns. Important implementation facilitators included acceptance of research evidence, valuing **recordings** as a communication tool, champions to promote **recordings**, positive feedback for clinicians who use **recordings**, and dedicated staff to support **recordings.** Producing research knowledge alone is often insufficient to change practice. This systematic identification of **consultation recording** implementation factors is vital to establishing and maintaining a **recording** service.[45]

Although none of the reviewed studies were conducted in low-income countries, some of the studies included participants from disadvantaged populations.[2, 22, 41] **Recordings** may be especially useful for those with low literacy or for non-English speakers, as the intervention does not rely on written information alone.[2, 22, 41] A patient in one study who spoke English as a second language thought the **recordings** allowed a careful review of sentences not initially understood.[3] This potential of **recordings** is important, as literacy is identified as a determinant of health and **recordings** may promote health literacy through a more accessible medium.[46] Further, one study reported that the commonly observed positive association between deprivation and anxiety was not found in patients who received a **recording**.[2] Thus, **recordings** may reduce the negative impact of socio-economic factors. These observations are noteworthy as a review of audio-recordings for health literacy found no studies of **recordings** with disadvantaged or low-literacy populations.[46]

Study limitations. First, we included evidence from cross-sectional descriptive studies to capture informative data about the use of, and satisfaction with, **recordings** in diverse settings. This study design is especially vulnerable to the impact of confounding variables and alternative explanations for the results.[47] Second, there were a number of studies in which **consultation recording** was part of a complex intervention that included other decision or communication aids.[19, 30, 32, 36] In a complex intervention, it may not be possible to attribute findings to a particular component of an intervention such as **the recording**. Lastly, all of the studies took place in Canada, US, Europe, or Australia. These findings may not be generalizable to countries in South America, Asia or Africa where there may be appreciable differences in healthcare provider-patient communication and the impact of **recordings.**

Implications for research. Although there has been some preliminary work carried out in regard to who benefits most from **recordings** and what types of consultations should be recorded, more research is needed.[7, 8, 10] The mechanisms by which benefits occur with **recordings** need to be better understood as this knowledge could inform outcome variables and the most appropriate measurement time-points.[7, 27] More research on the factors associated with valuing and utilizing **recordings** is needed. Continued investigation of **recordings** amongst diverse and disadvantaged populations would be insightful and support broader use of this intervention.[40] Further study is needed regarding healthcare providers' perspectives of patient self-recording, why more patients do not record their consultations, and how healthcare providers could enable patients to do so.[32] Given the **growing body of evidence supporting consultation recordings,** systematic implementation studies targeting the barriers and facilitators identified in this review are also needed.[31]

Clinical implications. The current review provides convincing evidence of the effectiveness of **recordings** in supporting informed decision making and demonstrates that patients value and use **recordings**. Findings also suggest that **recordings** can foster recall of information, the perception

of being informed, knowledge, and psychosocial adjustment in some situations. Although there were equivocal findings on certain outcomes, **recordings were** highly valued by patients and **are** not burdensome in regard to time and costs. This strength of the evidence suggests that **the routine implementation of recording** use should be **considered** in oncology, i.e., the clinical area with the largest, most compelling evidence base. **The findings of this review also indicate that recordings may be helpful for many patients but not for all. Providing patients with a choice of whether to receive the recording or other communication aids may be important to address personal preferences. Clinicians should also be aware of the potential for distress for some patients and provide adequate psychosocial supports, especially for distressing consultations.**

The findings also revealed that despite the positive evidence base for this intervention, several factors impede its uptake into clinical practice. Fears of litigation are a commonly expressed rationale for not recording consultations with patients. Concerns that these recordings may turn up in social media and other public domains are frequent. **However, Elwyn and colleagues[48] argue that liability insurers believe recordings actually protect clinicians, that patients primarily share their recordings with family and caregivers, and that clinicians may be able take legal action against patients who intentionally use a recording to harm their reputation. Although accurate information** can allay fears, other implementation hurdles exist. Organizational resource costs must be addressed to enable successful implementation. This review suggests that for implementation to be successful, treatment centers need to be committed to providing a **recording** service, assign responsibility for the service, **ensure recording equipment is available for all consultations,** and develop staff education materials among other associated implementation processes and materials. Time is necessary for staff education, and for evaluating and maintaining the service. While senior administrative levels may express concern that there are insufficient resources to support a **recording** service, **it is much less expensive now than in the past. The cost**

of recording and memory storage devises have dropped significantly over the past decade, and in some instances patients can record the consultations themselves on their cellular devices, thereby freeing up clinic resources that might otherwise have been used to purchase recording materials. The cost of educating staff in the service, and the cost of recording mediums such as digital recorders and USB memory keys is low when compared against other clinical services.

In the absence of a **recording** service, patients are recording consultations on their own, sometimes covertly, out of concern their clinicians may look upon them with disfavor if they express their intention or desire to have their consultations recorded. In one survey, 15% of respondents reported having covertly recorded a consultation, and 35% admitted that they would consider doing so.[39] If increasing numbers of patients are **desiring to** record consultations on their own,[39, 49-51] should clinical centers establish policies and procedures for addressing this trend? In most western nations, anecdotal legal opinion suggests that the law supports the right of citizens to record personal communications with a second party without second party consent, as both parties engaged in a mutually agreed to conversation are said to "own" the conversation. Moreover, an online public forum in the UK, which attracted legal commentary, concluded that patients did not have to seek permission to record consultations, and that such recordings were legal.[11] Additional study of the rights of patients and clinicians surrounding the use of **recordings** is needed to clarify the limit of any legal argument.

Moving forward, decisions should be made at the highest administrative levels as to whether the practice of **recording** is supported, and if so, then further decisions need to be made as to how to establish the service. If clinic staff are responsible for recording consultations, then standardized procedures will be required, including decisions surrounding which consultations to record, what parts of the consultation to record, whether the clinic will retain a copy of the recording, **and**

whether to include a disclaimer statement for legal protection. If patients are encouraged to record consultations, then how will patients become aware of the option to record their consultations? Implementation tips have been prepared for those wanting to initiate a **recording** service **(see Table 1).**[7] On the other hand, if administration decides not to support the use of **recordings** in practice, then procedures should be established for responding to patients who express a desire to record consultations, keeping in mind that an increasing number of patients are recording consultations covertly, and in most developed countries are likely protected by law in doing so.

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Conflicts of interest:

We have no conflicts of interest to declare.

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Table 1. Implementation Tips for Initiating and Establishing a Consultation Recording Service

- **Provide high quality and accessible evidence, such as systematic reviews, to ensure staff members are adequately informed and to promote practice change.**
- **Ensure administrative commitment of financial resources and staff to facilitate the management of recordings.**
- **Develop standardized procedures for consultation recordings including which consultations to record, what parts of the consultation to record, and whether the clinic will retain a copy of the recording.**
- **Select the most appropriate recording device for the target patient population, and ensure that technology is functioning and accessible for all consultations.**
- **Educate all staff, including physicians, on the procedures for recordings.**
- **Delegate the responsibility for recording the consultation to a specific staff member.**
- **Identify a respected champion with administrative or social power to promote consultation recordings.**
- **Inform all patients regarding the opportunity to have their consultation recorded.**
- **Offer patients a choice of whether to receive the recording or other communication aids to address personal preferences.**
- **Create a disclaimer and an informed consent form to address medico-legal concerns.**
- **Pilot consultation recordings so that staff can experience how it works and its impact on patients to promote buy-in.**
- **Establish policies and procedures for patients who desire to record consultations on their own to avoid covert recordings.**

Should Consultation Recording Use be a Practice Standard? A Systematic Review of the Effectiveness and Implementation of Consultation Recordings

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Abstract

Objective: To conduct a systematic review of the effectiveness of consultation recordings, and identify factors contributing to their successful implementation in healthcare settings.
Methods: A systematic review was conducted for quantitative studies examining the effectiveness of consultation recordings in healthcare. Two independent reviewers assessed the relevance and quality of retrieved quantitative studies using standardized criteria. Study findings were examined to determine consultation recording effectiveness and to identify barriers and facilitators to implementation. A supplementary review of qualitative evidence was performed to further explicate implementation factors.
Results: Of the 3,373 articles retrieved in the quantitative search, 26 satisfied the standardized inclusion criteria (12 randomized controlled trials, 1 quasi-experiment, and 13 cross-sectional studies). The majority of patients found consultation recordings beneficial. Statistically significant evidentiary support was found for the beneficial impact of consultation recordings on the following patient reported outcomes: knowledge, perception of being informed, information recall, decision-making factors, anxiety, and depression. Implementation barriers included strength of evidence concerns, patient distress, impact of the recording on consultation quality, clinic procedures, medico-legal issues, and resource costs. Facilitators included comfort with being recorded, clinical champions, legal strategies, efficient recording procedures, and a positive consultation recording experience.
Conclusions: Consultation recordings are valuable to patients and positively associated with patient reported outcomes. Successful integration of consultation recording use into clinical practice requires an administratively supported, systematic approach to addressing implementation factors.

Background

Patients commonly seek detailed diagnostic and treatment information to gain a fuller understanding of their disease and its management.[1, 2] Patients can be overwhelmed, however, by the complexity of information provided during healthcare consultations.[3] Elevated levels of anxiety may hinder efforts to process and retain information imparted during these consultations,[4] making it difficult to remember.[5, 6]

The most recent Cochrane review, conducted almost one decade ago, concluded that consultation recordings in oncology "may benefit most adults with cancer…most patients find them very useful".[5 p.2] The Cochrane review also identified further questions worth exploring, many of which have been the focus of subsequent research studies that have not been subjected to systematic review. Providing patients with audio-recordings of important consultations can reduce their anxiety, improve recall of information, and enhance their perception that they have been adequately informed about their disease and treatment.[5-9] Recordings enable greater patient participation in decisions surrounding disease management, reduce treatment decision regret, and facilitate patient satisfaction with care.[4, 5, 7, 8, 10] Despite the established benefits of recordings, use of this intervention in clinical practice is sporadic.

The provision of recordings of key consultations is topical and controversial. While some researchers and patient advocacy groups have argued for its routine use in clinical practice, many clinicians are hesitant to record consultations fearing litigation.[11] Many believe the evidence base is mixed and inconclusive, while others believe the resources required to implement the intervention preclude its use in standard care.[12] If implementation barriers are perceived to be strong enough to preclude implementation of an empirically validated intervention, then these barriers need to be remedied. The objectives of the present review were to: 1) Conduct a systematic review of the

effectiveness of consultation recording use; and 2) Review the consultation recording literature to identify key implementation factors and the best ways to address them.

Methods

Review Objective One

Inclusion and exclusion criteria. To be included, studies had to involve adults or children having a clinical consultation in a healthcare setting, after which the patient or family received a consultation recording (tape or digital). Primary quantitative study designs eligible for inclusion were randomized controlled trials (RCTs), quasi-experimental studies (QE), analytical cross-sectional (observational) studies, and descriptive cross-sectional studies. Studies from all countries were considered if they were written in English. We excluded studies that investigated written summaries or video recordings of consultations alone, did not provide the recording to the patient, or examined the use of standardized audio-recorded education materials. An a priori systematic review protocol guided this work. Research ethics board approval was not required for this systematic review.

Search strategy, study selection, and analysis. Online databases including MEDLINE, CINAHL, PsychINFO, EMBASE, Web of Science, Sociological Abstracts, and ProQuest Dissertations & Theses were systematically searched from January 1, 2002, to August 30, 2016 (see supporting information Table S1). A grey literature search was conducted of Conference Proceedings Citation Index, Grey Matters, Google Scholar, and relevant websites. Two independent reviewers (KR, TH) screened titles/abstracts of retrieved articles for potential inclusion criteria and one reviewer read the full-text of relevant articles to confirm eligibility. Two independent reviewers (KR, TH) critically assessed eligible RCTs with two widely used quality appraisal tools: the Joanna Briggs Institute (JBI) Critical Appraisal Tool for Randomized Controlled Trials[13] and the Effective Public Health Practice Project Quality Assessment Tool for Quantitative Studies (EPHPP).[14] Quasi-

experimental studies were assessed by two reviewers (KR, TH) with the JBI Critical Appraisal Tool for Quasi-Experimental Studies.[15] To be included in the review, an RCT or quasi-experimental study had to meet key criteria determined by two reviewers (see supporting information Table S2). Disagreements were resolved through discussion between the two reviewers. The PRISMA statement for reporting systematic reviews was utilized to frame the search and study selection process.[16] The heterogeneity of the samples, methods, and outcomes in the reviewed studies precluded a meta-analysis; therefore, the extracted data was analyzed using a narrative synthesis.

Review Objective Two

In addition to the descriptive findings and narrative comments contained within the quantitative papers from the first objective, a systematic review of the qualitative literature was conducted using terms associated with healthcare consultations, consultation recordings, and qualitative research.[17] (see supporting information Table S1) MEDLINE, CINAHL, and the grey literature were searched from January 1, 2002, to February 5, 2017. Two reviewers screened retrieved titles/abstracts for relevance (KR, TH), and all qualitative designs were included. Only data addressing the barriers and facilitators contributing to the successful implementation of recordings were extracted and thematically analyzed from the included quantitative and qualitative studies.

Results

Quantitative Studies for Inclusion

The database search for objective one retrieved 3359 articles, and an additional 14 articles were retrieved through searching the grey literature, reference lists, and Scopus using the forward search function (see Figure 1). After removing duplicates (n=1374), 1999 titles/abstracts were examined and 1911 articles were excluded for not meeting the inclusion criteria. The full texts of the remaining articles (n=88) were reviewed in-depth, and a further 61 articles were excluded.

Reasons for exclusion are provided in Figure 1. After critically appraising the RCT and QE studies, 12 RCTs, 1 QE study, and 13 cross-sectional descriptive (CS) studies were included. One RCT was excluded as it did not meet our quality criteria.[18]

Description and Quality Appraisal of Quantitative Studies

The majority of studies (see supporting information Table S3 for study details) examined consultation recordings for patients with cancer (n=19).[1-3, 8, 9, 19-32] Some unique oncology contexts included patients transitioning from curative to palliative care,[8] parents of children with leukemia having an initial consultation,[25] and migrant patients with cancer who requested an interpreter.[22] Three studies examined the usefulness of recordings for enhancing informed consent.[4, 20, 21] The remaining seven studies occurred outside of the oncology context.[4, 10, 33-37] The geographical settings included the United Kingdom, [2, 4, 10, 26, 28-30, 33, 34] United States,[1, 19, 24, 32, 36] Canada,[9, 21, 27, 31] Australia,[3, 22, 23, 37] Sweden,[20] The Netherlands,[8] Italy,[25] and Denmark.[35] Supporting information table S2 summarizes the RCT and QE quality appraisals. On the JBI checklist,[13] 11 RCTs received 8-13 out of a possible 13 points, and one received 5-7 points. On the EPHPP tool,[14] five RCTs received a strong global rating, five received a moderate rating, and two received a weak rating. The one QE[26] study received seven out of nine points on the JBI QE tool.[15]

Description of Qualitative Studies

In addition to the descriptive data and narrative comments from the quantitative studies, 12 qualitative studies were included to answer the second review objective. These qualitative studies were identified when screening titles/abstracts for objective one or found in the 92 articles retrieved in the systematic search for objective two. Studies explored patients' experiences/perspectives of consultation recording[26, 31, 34, 36, 38-42] and healthcare professionals' experiences of consultation recording implementation.[12, 31, 34, 36, 40, 43, 44] The qualitative studies took place in the United States,[36, 38, 40, 43, 44] UK, [26, 34, 39, 41, 42] Canada,[31] and Australia.[12]

Objective One: Effectiveness of Consultation Recordings

Satisfaction. Patients had an overall positive perspective of consultation recordings. Sixteen studies (7 RCTs, 9 CS) reported that the majority of participants found recordings useful or beneficial, with a range of 55-98% across studies.[1-3, 8, 10, 20, 22-25, 28-30, 34, 36, 37] However, listening to the recording was distressing (3-18%)[2, 20, 29] or a source of anxiety (19-26.8%)[3, 25] for small proportions of participants. In one study, participants had a marginally significant preference for consultation recordings over standardized audio-recordings.[21] In another study, 17 (57%) patients preferred to receive both a recording and summary letter, 7 preferred the audio-recording alone, and 3 preferred the letter alone, with participants more likely to give the recording (69%) to a family member or friend than the letter (50%).[3] Five RCTs examined if recordings had an impact on the patients' satisfaction with communication with the health provider, but none found significant differences.[9, 21, 23, 27, 37]

Use of consultation recordings. Most studies reported that the majority of participants (51-100%) listened to their recordings,[2-4, 8-10, 19, 20, 22-25, 27-29, 31-34, 37] although one study found that only 31% of participants listened.[35] Some participants listened more than once, with an average use of 1.3 to 3.0 times.[9, 10, 21, 25-28, 30, 31] Reasons cited for not listening included technological issues,[26, 31, 35] not wanting to revisit their decision,[26] feeling they had received sufficient information already,[3, 26, 29, 31] worrying it would evoke negative emotions,[20, 29] intending the recording for a family member,[29] being overwhelmed or too busy,[31, 34] desiring to move on,[3, 31] preferring another modality,[31] feeling too sick,[31] disliking the sound of their voice,[34] and lacking the privacy to listen to the recording.[34] When patients were prompted to record their own consultations, one study found that only 20% did so.[32] Between 20 and 100% of participants in 14 studies reported that they shared their recording with others.[1-3, 8-10, 19, 20, 22, 23, 27, 29, 31, 32] Patients shared their recording with spouses/partners, children, family members, friends, and doctors. A number of factors were

associated with using the recording including increased anxiety,[23] being married,[3] receiving bad news,[3] having longer consultations,[3] increasing age,[35] and gender (female patients and their relatives replaying together; relatives of male patients replaying alone).[35]

Knowledge, perception of being informed, and recall of information. Nine (75.0%) RCTs assessed the impact of recordings on knowledge, perception of being informed, or recall of information, and five found significant positive results. Of the four RCTs specifically measuring knowledge, three investigated knowledge relevant to enhancing informed consent[4, 20, 21] and only one demonstrated significant findings.[4] Two[9, 27] of the three[9, 21, 27] studies examining patients' perception of being informed, and two[2, 37] of the three[2, 33, 37] studies measuring recall, showed that the recording provided significant benefit.

Psychological health and well-being. Seven (58.3%) RCTs measured anxiety, depression, and/or stress,[2, 4, 10, 23, 30, 33, 37] and significant differences were observed in three studies. In two studies, recordings significantly reduced participants' anxiety[4, 33] and in one study it reduced their depression.[4] Another RCT found significant decreases in anxiety and depression when the analysis was repeated with only those who had listened to the recording.[23] There were no other RCTs that reported a statistically significant impact of recordings on psychological adjustment,[9, 27, 30] quality of life,[8, 9, 27] treatment adherence,[10] or openness to discussing cancer-related issues in the family.[8]

Decision making. Of the three studies assessing the impact of consultation recordings on concepts associated with decision making, all had significant findings. One study found significantly higher decisional self-efficacy,[30] and two found lower decisional regret,[26, 30] for those who had received a recording. In the QE study, receiving a recording was positively associated with less decision regret, and was even a stronger predictor of decision regret than erectile dysfunction or incontinence.[26] Another RCT measured health locus of control, and found that the consultation

recording group reported a significantly higher sense of control regarding their own health than the control and standardized recording groups.[4]

Objective Two: Barriers and Facilitators to Consultation Recording

The synthesis for the second question revealed noteworthy individual, interpersonal, and system barriers to implementing consultation recordings, as well as critical facilitators.[12]

Perceived value of consultation recording and the evidence. The qualitative findings showed that both patients and practitioners valued consultation recordings.[12, 31, 36, 39, 42] Patients appreciated recordings for the purposes of enhancing patient-centred communication and fostering empowerment.[39] Some practitioners questioned whether recordings benefited those with a passive decision making style.[12] Healthcare professionals had differing assessments of the empirical evidence on recordings, with the majority being unaware of the supporting evidence base.[12, 31] The provision of high quality, accessible evidence such as systematic reviews and clinical practice guidelines was identified as an essential facilitator to ensuring staff were adequately informed, and promoting practice change.[31]

Clinician's motivation. Positive feedback motivated clinicians to continue with recordings. Piloting and evaluating consultation recording was identified as a means by which to promote the "buy-in" of stakeholders and to inspire routine implementation,[12] through exposure to the benefits.[29, 40, 43] One study offered a feedback letter to oncologists espousing the patient-reported benefits of recordings to reinforce the importance of continuing the practice.[31]

Fear of distressing patients. Clearly identified barriers included concerns that recordings could increase patients' anxiety when replaying distressing content or impose an undesired active decision-making role on patients.[2, 12, 29] Practitioners noted that certain visits might not be wholly appropriate for recording, such as consultations in which bad news was given, the patient became upset, or the patient was extremely anxious.[12, 29]

Impact on the consultation. Variation in perspectives regarding the impact of recording on the consultation determined whether this factor was a barrier or facilitator. Some healthcare workers reported feeling anxious or self-conscious about what they said when being recorded as well as concerned that the recording would make the communication more formal, factual, or structured.[12, 20, 29] Practitioners noted that consultations are not always a straightforward provision of information and that a desire to create a coherent recording could be a barrier.[12] In contrast, others felt at ease with being recorded[40] or thought that more detailed information was given with recordings.[29] Some patients thought the intervention might violate the traditional etiquette of the doctor-patient relationship; thus, challenging the clinicians' status or damaging the relationship.[39] Others believed that the recording process would not hinder physicians from sharing information, might increase their accountability, and could enhance respect for clinicians who were willing to be recorded.[39]

Clinical champions. An essential facilitator of successful implementation was leadership, that is, an identified, respected champion with the administrative or social power to advocate for the intervention, and obtain necessary funds and staff resources for a consultation recording program.[31] Support from physicians conducting the consultations was crucial for successful implementation, as was their consistency in following the recording procedures.[44]

Legal and privacy concerns. There was evidence that legal and privacy concerns were substantial barriers to recordings. Physicians were concerned about medico-legal implications, such as who owns the recording, whether the treatment center should retain a copy, how to store the recordings within existing medical records, if the recording might be used in a lawsuit, and with whom the recording would be shared.[12, 29, 31] There were also concerns about a breach of confidentiality if the consultation was shared without permission, and a loss of control of the recording if it was posted on the internet.[1, 34, 39] An important facilitator was assuring that legal requirements were met.[12] One strategy involved creating a disclosure/consent form for patients,

providers, and the organization, and ensuring the consent process communicated the patients' and providers' rights, obligations, and the appropriate forms of distribution for the recording.[12] One center created a disclaimer which clearly stated that the recording had not been reviewed by physicians, could contain errors or omissions, and that it was primarily for the convenience and personal use of patients.[43]

Required resources and technology. There were reservations about the amount of time that recordings might require in an already overloaded clinical setting.[12, 24, 36, 43] However, researchers reported that recordings did not substantially increase the length of consultations,[1, 9, 10, 24, 29] and some even found it was an efficient means of promoting the doctor-patient partnership.[10, 12, 34] Intervention and resource costs were identified as other primary barriers to the sustainable implementation of recordings.[12, 31, 36, 40] One cost-saving facilitator was integrating recording procedures into existing staff roles.[40] Technology was highlighted as a facilitator when no significant technical problems occurred,[8] and as a barrier when malfunctioning or inaccessible equipment hindered the intervention.[9, 10, 22, 29, 34, 37] Researchers cited poor recording quality as a barrier to use.[3, 8, 24, 26, 34] With an array of recording options, selecting the most appropriate recording technology for the target patient population was an important consideration.[34, 41] The growing accessibility of smartphones for self-recording of consultations was acknowledged as holding potential for facilitating recordings.[12, 39]

Logistics and procedures. Logistical facilitators included recordings posing a minimal burden to the clinical environment and embedding recordings into usual care.[12] Clear procedures and staff support were critical to preventing problems with recordings and avoiding increased consultation time.[8, 12] Significant logistical components of supporting recordings included organized scheduling, informing patients of the benefits of recordings and their option to record, ensuring the recording

occurred despite time pressures, and delivering the recording to the patient.[12, 24, 31, 38, 43] To address concerns of recordings causing distress, patients should be offered the choice of receiving a recording rather than systematically providing one to all patients.[12] To avoid covert self-recordings, procedures should be in place to allow patients to record their own consultations.[12, 39]

Conclusions

This systematic review builds upon previous work by including the most recent literature and elucidating the barriers and facilitators of routine implementation. The findings demonstrate that consultation recordings enhance decision-making and patient satisfaction, and that patients frequently listen to their recordings and share them with others. Although patients derive benefits from recordings, there were equivocal findings regarding knowledge, information recall, the perception of being informed, and psychological well-being.

Only a proportion of the studies reported significant results for anxiety and depression. It may be unreasonable to expect patients' psychological well-being to be significantly improved by a recording only a short time after a life-altering diagnosis.[9] There was also variation in patients' perceptions of recordings and identified factors that contributed to their use. Recordings may also resonate more with certain individuals depending on their preferred coping mechanisms. If patients prefer to use denial as a coping mechanism, recordings may not be valuable to them, and may actually cause anxiety.[6]

The findings of this present review had notable differences with the earlier Cochrane review[5] A distinct finding, which was only evident in this review, was that recordings had an unequivocally positive impact on concepts associated with decision making. Lower decision regret may be a result of consultation recordings enhancing patients' understanding of the risks, benefits, and outcomes of various treatments, all contributing to more fully informed decision making.[26]

This review also extended the Cochrane review by identifying key implementation factors and strategies to address them. Barriers to implementation of recordings included a lack of awareness of the empirical evidence on recordings, feeling self-conscious about being recorded, perceptions that the recording process will negatively impact the consultation, variation in physician cooperation with recording procedures, lack of staff and financial resources, and medico-legal concerns. Important implementation facilitators included acceptance of research evidence, valuing recordings as a communication tool, champions to promote recordings, positive feedback for clinicians who use recordings, and dedicated staff to support recordings. Producing research knowledge alone is often insufficient to change practice. This systematic identification of consultation recording implementation factors is vital to establishing and maintaining a recording service.[45]

Although none of the reviewed studies were conducted in low-income countries, some of the studies included participants from disadvantaged populations.[2, 22, 41] Recordings may be especially useful for those with low literacy or for non-English speakers, as the intervention does not rely on written information alone.[2, 22, 41] A patient in one study who spoke English as a second language thought the recordings allowed a careful review of sentences not initially understood.[3] This potential of recordings is important, as literacy is identified as a determinant of health and recordings may promote health literacy through a more accessible medium.[46] Further, one study reported that the commonly observed positive association between deprivation and anxiety was not found in patients who received a recording.[2] Thus, recordings may reduce the negative impact of socio-economic factors. These observations are noteworthy as a review of audio-recordings for health literacy found no studies of recordings with disadvantaged or low-literacy populations.[46]

Study limitations. First, we included evidence from cross-sectional descriptive studies to capture informative data about the use of, and satisfaction with, recordings in diverse settings. This

study design is especially vulnerable to the impact of confounding variables and alternative explanations for the results.[47] Second, there were a number of studies in which consultation recording was part of a complex intervention that included other decision or communication aids.[19, 30, 32, 36] In a complex intervention, it may not be possible to attribute findings to a particular component of an intervention such as the recording. Lastly, all of the studies took place in Canada, US, Europe, or Australia. These findings may not be generalizable to countries in South America, Asia or Africa where there may be appreciable differences in healthcare provider-patient communication and the impact of recordings.

Implications for research. Although there has been some preliminary work carried out in regard to who benefits most from recordings and what types of consultations should be recorded, more research is needed.[7, 8, 10] The mechanisms by which benefits occur with recordings need to be better understood as this knowledge could inform outcome variables and the most appropriate measurement time-points.[7, 27] More research on the factors associated with valuing and utilizing recordings is needed. Continued investigation of recordings amongst diverse and disadvantaged populations would be insightful and support broader use of this intervention.[40] Further study is needed regarding healthcare providers' perspectives of patient self-recording, why more patients do not record their consultations, and how healthcare providers could enable patients to do so.[32] Given the growing body of evidence supporting consultation recordings, systematic implementation studies targeting the barriers and facilitators identified in this review are also needed.[31]

Clinical implications. The current review provides convincing evidence of the effectiveness of recordings in supporting informed decision making and demonstrates that patients value and use recordings. Findings also suggest that recordings can foster recall of information, the perception of being informed, knowledge, and psychosocial adjustment in some situations. Although there were equivocal findings on certain outcomes, recordings were highly valued by patients and are not

burdensome in regard to time and costs. This strength of the evidence suggests that the routine implementation of recording use should be considered in oncology, i.e., the clinical area with the largest, most compelling evidence base. The findings of this review also indicate that recordings may be helpful for many patients but not for all. Providing patients with a choice of whether to receive the recording or other communication aids may be important to address personal preferences. Clinicians should also be aware of the potential for distress for some patients and provide adequate psychosocial supports, especially for distressing consultations.

The findings also revealed that despite the positive evidence base for this intervention, several factors impede its uptake into clinical practice. Fears of litigation are a commonly expressed rationale for not recording consultations with patients. Concerns that these recordings may turn up in social media and other public domains are frequent. However, Elwyn and colleagues[48] argue that liability insurers believe recordings actually protect clinicians, that patients primarily share their recordings with family and caregivers, and that clinicians may be able take legal action against patients who intentionally use a recording to harm their reputation. Although accurate information can allay fears, other implementation hurdles exist. Organizational resource costs must be addressed to enable successful implementation. This review suggests that for implementation to be successful, treatment centers need to be committed to providing a recording service, assign responsibility for the service, ensure recording equipment is available for all consultations, and develop staff education materials among other associated implementation processes and materials. Time is necessary for staff education, and for evaluating and maintaining the service. While senior administrative levels may express concern that there are insufficient resources to support a recording service, it is much less expensive now than in the past. The cost of recording and memory storage devises have dropped significantly over the past decade, and in some instances patients can record the consultations themselves on their cellular devices, thereby freeing up clinic resources

that might otherwise have been used to purchase recording materials. The cost of educating staff in the service, and the cost of recording mediums such as digital recorders and USB memory keys is low when compared against other clinical services.

In the absence of a recording service, patients are recording consultations on their own, sometimes covertly, out of concern their clinicians may look upon them with disfavor if they express their intention or desire to have their consultations recorded. In one survey, 15% of respondents reported having covertly recorded a consultation, and 35% admitted that they would consider doing so.[39] If increasing numbers of patients are desiring to record consultations on their own,[39, 49-51] should clinical centers establish policies and procedures for addressing this trend? In most western nations, anecdotal legal opinion suggests that the law supports the right of citizens to record personal communications with a second party without second party consent, as both parties engaged in a mutually agreed to conversation are said to "own" the conversation. Moreover, an online public forum in the UK, which attracted legal commentary, concluded that patients did not have to seek permission to record consultations, and that such recordings were legal.[11] Additional study of the rights of patients and clinicians surrounding the use of recordings is needed to clarify the limit of any legal argument.

Moving forward, decisions should be made at the highest administrative levels as to whether the practice of recording is supported, and if so, then further decisions need to be made as to how to establish the service. If clinic staff are responsible for recording consultations, then standardized procedures will be required, including decisions surrounding which consultations to record, what parts of the consultation to record, whether the clinic will retain a copy of the recording, and whether to include a disclaimer statement for legal protection. If patients are encouraged to record consultations, then how will patients become aware of the option to record their consultations? Implementation tips have been prepared for those wanting to initiate a recording service (see Table

1).[7] On the other hand, if administration decides not to support the use of recordings in practice, then procedures should be established for responding to patients who express a desire to record consultations, keeping in mind that an increasing number of patients are recording consultations covertly, and in most developed countries are likely protected by law in doing so.

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Conflicts of interest:

We have no conflicts of interest to declare.

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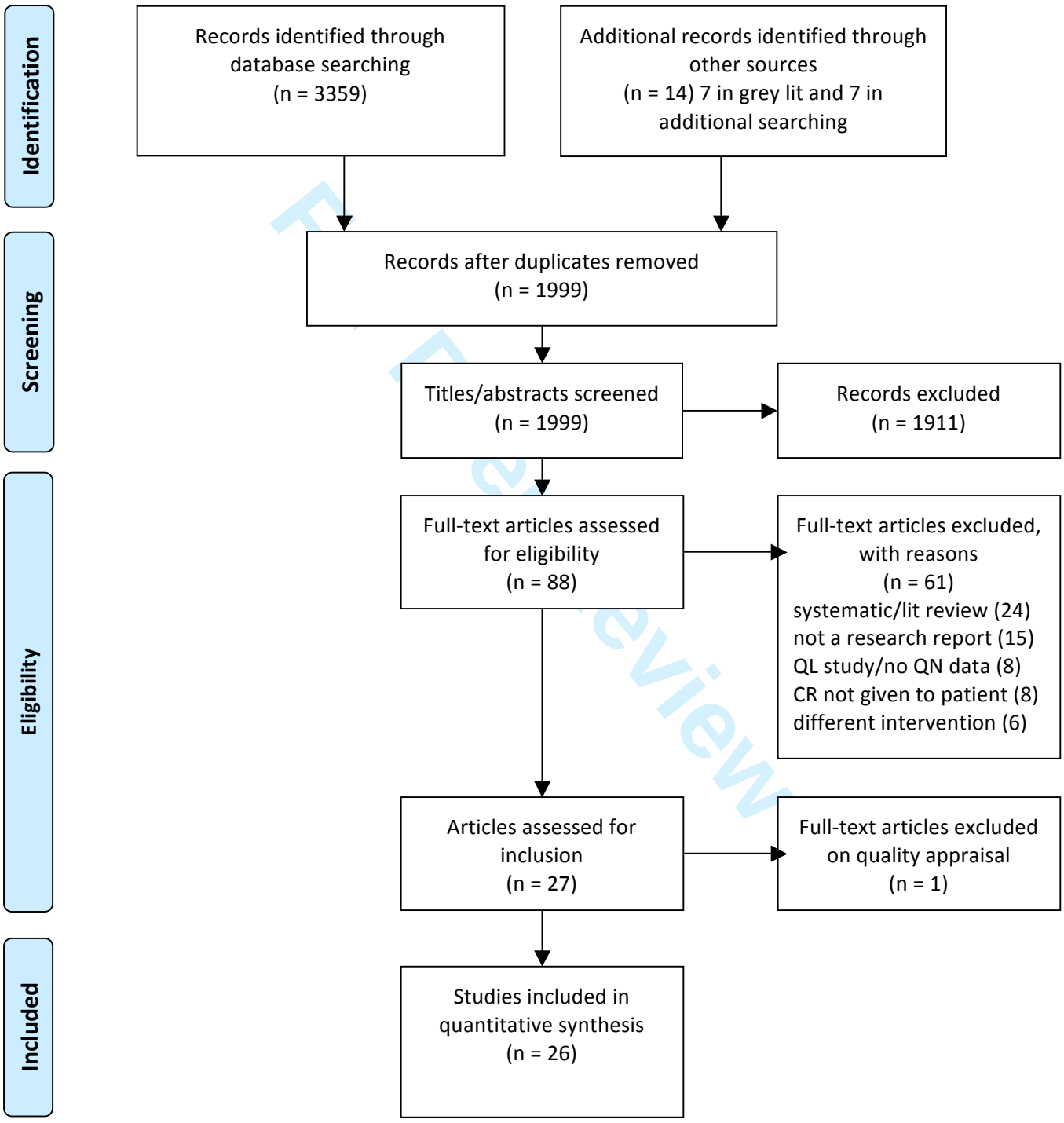
Table 1. Implementation Tips for Initiating and Establishing a Consultation Recording Service

- Provide high quality and accessible evidence, such as systematic reviews, to ensure staff members are adequately informed and to promote practice change.
- Ensure administrative commitment of financial resources and staff to facilitate the management of recordings.
- Develop standardized procedures for consultation recordings including which consultations to record, what parts of the consultation to record, and whether the clinic will retain a copy of the recording.
- Select the most appropriate recording device for the target patient population, and ensure that technology is functioning and accessible for all consultations.
- Educate all staff, including physicians, on the procedures for recordings.
- Delegate the responsibility for recording the consultation to a specific staff member.
- Identify a respected champion with administrative or social power to promote consultation recordings.
- Inform all patients regarding the opportunity to have their consultation recorded.
- Offer patients a choice of whether to receive the recording or other communication aids to address personal preferences.
- Create a disclaimer and an informed consent form to address medico-legal concerns.
- Pilot consultation recordings so that staff can experience how it works and its impact on patients to promote buy-in.
- Establish policies and procedures for patients who desire to record consultations on their own to avoid covert recordings.

Figure 1. PRISMA Flow Diagram of Search and Study Selection Process



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). *P*referred *R*eporting *I*tems for *S*ystematic Reviews and *M*eta-*A*nalyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit www.prisma-statement.org.

Table S1. Quantitative and Qualitative Review Search Strategies for MEDLINE Ovid

Quantitative Review Search Strategy for MEDLINE Ovid
1. consultation$ 2. office adj3 visit$ 3. doctor adj 3 visit$ 4. clinic adj 3 visit$ 5. appointment$ 6. "patient-provider communication" 7. patient adj3 education 8. patient adj3 participation 9. patient adj3 communication 10. family adj3 education 11. family adj3 participation 12. family adj3 communication 13. parent adj3 education 14. parent adj3 participation 15. parent adj3 communication 16. sibling adj3 education 17. sibling adj participation 18. sibling adj3 communication 19. Physician-Patient Relations/ 20. Professional-Patient Relations/ 21. Office Visits/ 22. Health education/ 23. Referral and Consultation/ 24. Decision Making/ 25. Communication/ 26. Appointments and Schedules/ 27. Health Communication/ 28. Professional-Family Relations/ 29. Access to Information/ 30. or/1-29 31. recording$ adj4 consultation$ 32. audiotap$ 33. "audio-tap$" 34. audiorecord$ 35. "audio record$" 36. audio adj3 tap$ 37. audio adj3 record$ 38. digital$ adj3 record$ 39. "tape record$" 40. "taped conversation$" 41. Tape Recording/ 42. or/31-41 43. quantitative

44. clinical adj1 trial$
45. allocate$ adj2 random$
46. "follow up" adj1 study
47. "follow up" adj1 studies
48. observational adj1 study
49. observational adj1 studies
50. "cross sectional" adj1 study
51. "cross-sectional" adj1 studies
52. randomize$
53. radomis$
54. experiment$
55. investigation
56. quasi-experiment$
57. "controlled trial$"
58. quasi-randomised
59. quasi-randomized
60. "non-randomised controlled trial$"
61. "non-randomized controlled trial$"
62. survey$
63. "prospective study"
64. "pilot study"
65. "descriptive statistics"
66. cross-sectional adj3 analysis
67. Randomized Controlled Trial.pt
68. EXP Epidemiological Studies/
69. Random Allocation/
70. Double-Blind Method/
71. Single-Blind Method/
72. EXP Clinical Trial/
73. Controlled Clinical Trial.pt.
74. Clinical trial.pt
75. Multicenter Studies.pt.
76. Prospective Studies Retrospective Studies Longitudinal Studies/
77. Observational study Observational study.pt
78. Surveys and Questionnaires Regression analysis/
79. EXP Analysis of Variance/
80. Cross-sectional studies/
81. Statistics, Nonparametric/
82. or/43-81
83. 30 and 42 and 82
84. limit 83 to yr = 2002-August 30, 2016
85. limit 84 = English language

Qualitative Review Search Strategy for MEDLINE Ovid

1. consultation$
2. office adj3 visit$

3. doctor adj 3 visit$
4. clinic adj 3 visit$
5. appointment$
6. "patient-provider communication"
7. patient adj3 education
8. patient adj3 participation
9. patient adj3 communication
10. family adj3 education
11. family adj3 participation
12. family adj3 communication
13. parent adj3 education
14. parent adj3 participation
15. parent adj3 communication
16. sibling adj3 education
17. sibling adj participation
18. sibling adj3 communication
19. Physician-Patient Relations/
20. Professional-Patient Relations/
21. Office Visits/
22. Health Education/
23. Referral and Consultation/
24. Decision Making/
25. Communication/
26. Appointments and Schedules/
27. Health Communication/
28. Professional-Family Relations/
29. Access to Information/
30. or/1-29
31. consultation$ adj4 recording$
32. consultation$ adj4 tape$
33. consultation$ adj4 digital
34. or/31-33
35. qualitative
36. interviews$
37. "focus group$"
38. themes
39. "thematic analysis"
40. Focus Groups/
41. EXP Qualitative Research/
42. Interview/
43. or/35-42
44. 30 and 34 and 43
45. limit 44 to yr = 2002-February 5, 2017
46. limit 45 = English language

Table S2: Summary of Quality Appraisals

RCTs: JBI Quality Appraisal Tool

Author(s)	Randomization	Allocation Concealment	Similar Groups	Participants Blinded	HCP Blinded	Outcome Assessors Blinded	Identical Treatment	Follow-up	ITT	Procedures for Measurement	Reliable Measurement	Statistical Analysis	Trial Design
Bergenmar et al.[20]	U	U	Y	Y	Y	N/A	Y	N	N	Y	Y	Y	Y
Cope et al.[33]	Y	U	Y	N	N	U	Y	N	N	Y	Y	Y	Y
Hack et al.[9]	Y	Y	Y	Y	Y	Y	Y	U	N	Y	Y	Y	Y
Hack et al.[27]	Y	Y	Y	Y	Y	Y	Y	U	N	Y	Y	Y	Y
Hack et al.[21]	Y	U	Y	Y	Y	Y	Y	U	N	Y	Y	Y	Y
Hacking et al.[30]	Y	Y	Y	N	N	N	Y	Y	N	Y	Y	Y	Y
Koh et al.[37]	Y	Y	Y	U	U	N	Y	Y	Y	Y	Y	U	Y
Liddell et al.[10]	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	U	Y	Y
Lobb et al.[23]	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Mishra et al.[4]	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Stephens et al.[2]	U	N	Y	N	N	N	Y	Y	Y	Y	Y	Y	Y
Uitdehaag et al.[8]	U	Y	U	Y	Y	Y	Y	Y	N	Y	Y	U	Y

Key: Y=yes; N=no; U=unclear; N/A=not applicable; Excluded if less than 5 Y ratings or 2 or more N ratings on questions 1, 3, 4, 10, 11, & 12

RCTS: EPHPP Quality Appraisal Tool

Author(s)	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Global Rating
Bergenmar et al.[20]	M	S	S	M	M	M	S
Cope et al.[33]	W	S	S	M	S	S	M
Hack et al.[9]	S	S	S	S	S	S	S
Hack et al.[27]	S	S	S	S	S	S	S
Hack et al. [21]	M	S	S	M	W	W	W
Hacking et al. [30]	W	S	W	M	S	S	W
Koh et al. [37]	M	S	S	M	S	W	M
Liddell et al. [10]	M	S	S	M	W	S	M
Lobb et al. [23]	M	S	S	M	S	S	S
Mishra et al. [4]	M	S	S	M	S	S	S
Stephens et al. [2]	M	S	S	W	S	S	M
Uitdehaag et al.[8]	M	S	W	M	S	M	M

Key: S=strong; M=moderate; W=weak; Excluded if 3 or more W non-global category ratings

Quasi-experimental Study: JBI Quality Appraisal Tool									
Author(s)	Clear IV and DV	Similar Groups	Similar Treatment	Control Group	Multiple Measurements	Follow-up	Procedure for Measurement	Reliable Measurement	Statistical Analysis
Good et al.[26]	Y	Y	Y	Y	N	N	Y	Y	Y
Key: Y=yes; N=no Excluded if 2 or more N ratings on questions 2, 7, 8, & 9									

Table S3. Summary of Study Characteristics

Characteristics of Randomized Controlled Trials and Quasi-experimental Study					
Study	Study Design & Setting	Sample Characteristics	Intervention	Outcome Measures	Results
Bergenmar et al., 2014 (Sweden)	RCT; participants randomly assigned to an intervention group (n=67) or a control (n=63) group. Department of oncology.	N=130 Diagnosis: breast, gastro-intestinal, or prostate cancer Mean age: 54 years (control), 55 years (intervention) Gender: 23 males and 107 females	Consultation recording (CR) of a medical consultation with an oncologist about a phase 2 or 3 clinical trial	**Knowledge and understanding** Tool: Quality of Informed Consent **Use and perception of audio-recording**	No statistically significant differences between groups on knowledge and understanding. In the intervention group, 43% (n=29) listened to the complete recording, and 9% (6) listened to parts. Of the patients who reported listening to the CD, 69% found it quite/vey helpful in understanding information about the clinical drug trial and 78% rated it as quite/very beneficial.
Cope et al., 2003 (United Kingdom)	RCT; participants randomly assigned to four information groups: a non-technical letter (n=29), an audiotape of the consultation (n=29), an audiotape and non-technical letter (n=30), or standard information (n=29). Fetal Medicine Clinic, Birmingham Women's Hospital.	N= 117 Diagnosis: suspected fetal anomalies Mean age: 28 years Gender: all female Race/ ethnicity: White (n=105), Asian (n=5), African/ Caribbean (n=2), Other (n=2)	CR of a consultation about a mid-trimester fetal scan	**State and trait anxiety** Tool: Speilberger Stat-Trait Anxiety Inventory **Depression** Tool: Beck Depression Inventory **Recall of information** Tool: semi-structured telephone interview assessing free and cued recall **Use of letters and tapes**	Women in the audiotape group reported significantly less anxiety than the control group two weeks after the consultation. No significant differences between information groups on depression scores or recall of information. 53.6% of women used the tape, 87.0% of women used the letter, 24% of the women fully used the tape/letter, and 64% partially used the tape/letter.
Hack et al., 2003 (Canada)	RCT; participants randomly assigned to four groups: standard care with no audiotape	N= 628 Diagnosis: breast cancer Mean age:	CR of a primary adjuvant treatment	**Perception of having been informed** Tool: Informed Communication Scale	Women who received the audiotape reported receiving significantly more information about the side effects of treatment compared to

	(n=158), audiotaped but no audiotape given (n=147), audiotaped and patient given audiotape (n=174), or audiotaped and patient offered choice of whether to receive audiotape (n=149). Tertiary or community oncology clinic (N=6 sites).	56.5 years (SD, 12 years) Gender: all female	consultation	**Audiotape satisfaction** Tool: Audiotape Use and Satisfaction Questionnaire **Audiotape use** Tool: Audiotape Use and Satisfaction Questionnaire **Communication satisfaction with oncologist** Tool: Patient Perception Scale **Psychological adjustment/mood state** Tool: Profile of Mood States **Cancer-specific quality of life** Tool: Functional Assessment of Cancer Therapy-Breast	those who did not receive the audiotape. Women rated the audiotape positively with a mean of 83.9/100 (SD 19.6). 60.7% of patients listened to at least a portion of the tape. Participants listened to the entire tape an average of 2.2 times, and the partial tape an average of 2.5 times. No significant differences between groups on communication satisfaction with oncologist**,** psychological adjustment/mood state, or cancer-specific quality of life.
Hack et al., 2007 (Canada)	RCT; participants randomly assigned to four groups: standard care control with no audiotape (n=113), audiotape with no audiotape given (n=98), audiotaped and audiotape given (120), or audiotape with choice to receive audiotape (n=94). Tertiary oncology clinics (N= 4 sites).	N= 425 Diagnosis: prostate cancer Mean age: 67.4 years (SD, 7.7 years) Gender: all male	CR of a primary treatment consultation	**Perception of having been informed** Tool: Informed Communication Scale **Audiotape satisfaction** Tool: Audiotape Use and Satisfaction Questionnaire **Audiotape use** Tool: Audiotape Use and Satisfaction Questionnaire **Communication satisfaction with oncologist** Tool: Patient Perception Scale	Participants who received the audiotape reported having been provided with significantly more information overall, more information about treatment alternatives, and more treatment side effects information compared to those who did not receive the audiotape. Participants rated the audiotape positively with a mean of 83.0/100 (SD 19.2). 65.4% of patients listened to the tape. Participants listened to the entire consultation an average of 2.8 times and a portion an average of 3.0 times. No significant differences between groups on communication

				Psychological adjustment/mood state Tool: Profile of Mood States **Cancer-specific quality of life** Tool: Functional Assessment of Cancer Therapy-Prostate	satisfaction with oncologist, psychological adjustment/mood state, or cancer-specific quality of life.
Hack et al., 2007 (Canada)	RCT; participants randomly assigned to three groups: standardized audiotape (n=22), consultation audiotape (n=20), or both audiotapes (n=27). Canadian cancer centres (N= 5 sites).	N= 69 Diagnosis: breast cancer Gender: all female Race/ ethnicity: Caucasian (98.6%) and Asian (1.4%)	CR of a clinical trial consultation with an oncologist	**Perception of being informed about the clinical trial** Tool: Informed Consent Questionnaire **Knowledge of information relevant to providing informed consent** Tool: Informed Consent Questionnaire **Satisfaction with communication during the consultation** Tool: The Patient Perception Scale **Use and satisfaction with audiotape** Tool: The Audiotape Use Questionnaire **Analysis of tape content**	No significant differences between groups on perception of being informed, knowledge, or satisfaction with communication. There was a marginally significant preference for a consultation recording over a standardized audiotape.
Hacking et al., 2013 (United Kingdom)	RCT; participants randomly assigned to usual care group (n=60) or an intervention group (n=63). Diagnostic clinic,	N= 113 Diagnosis: primary prostate cancer Mean age: 67.2 years (control), 65.4	Providing a CD of the consultation as part of a complex intervention	**Confidence about treatment decisions** Tool: Decisional Self-efficacy **Decisional conflict** Tool: Decisional Conflict Scale	Significantly higher decisional self-efficacy and lower decisional regret for the intervention group at 6 months. Decisional conflict was significantly lower for intervention group patients initially but not at follow-up. No significant

	Western General Hospital.	years (intervention) Gender: all male Race/ethnicity: Caucasian (100%)		**Decisional regret** Tool: Decisional Regret scale **Measurements of Mood and Adjustment** Tool: Hospital Anxiety and Depression Scale and Mental Adjustment to Cancer Scale **Rating of the navigation intervention** Tool: 5-item navigation rating scale based on the Decision Preparation Measure	differences between groups on measurements of mood and adjustment. 91.9% found the decision navigation intervention very helpful and 8.1% somewhat helpful. Intervention group participants used the consultation recording an average of 2.35 times.
Koh et al., 2007 (Australia)	RCT; participants randomly assigned to an intervention group (n=102) or a control group (n=98). Neonatal Intensive Care Unit, Townsville Hospital.	N= 200 mothers Diagnosis: infant in NICU Gender: all female	CR of consultations with a neonatologist	**Recall of information** Tool: face-to-face telephone interview with mothers **Attitudes to and Use of the tape** Tool: not described **Satisfaction with conversations** Tool: not described **Postnatal depression** Tool: Edinburgh Postnatal Depression Scale **Anxiety** Tool: Spielberger State Anxiety Inventory **Stress about parenting** Tool: General Health	Mothers in the intervention group were able to recall significantly more information about diagnosis, treatment, and outcome compared to mothers in the control group at 10 days and 4 months. 71-92% found the tape helped them to understand, reminded them of the discussion, and helped a family member to understand. 91% of the mothers listened to the tape; mothers listened to the tape a range of 1-10 times. No significant differences between groups on satisfaction with conversations until a sub-group analysis demonstrated that mothers of babies with poor outcomes in the intervention group were significantly more satisfied with the conversation. No significant differences between groups on depression, anxiety, or

				Questionnaire	stress about parenting.
Liddell et al., 2004 (United Kingdom)	RCT; participants randomly assigned to an experimental group (n=95) or a control group (n=85). General practice (N=2 sites).	N= 180 Mean age: 40 years Diagnosis: varied; attending a GP appointment Gender: male (n=92) and female (n= 88)	CR of a routine consultation in a general practice setting	**Use of tape** **Adherence to GP's advice** Tool: Single item measure **Anxiety about condition** Tool: single item measure	64% found the CR 'useful' or 'very useful'. 61% of patients listened to the tape by 7-10 days. Participants listened to the tape an average of 1.5 times. No significant between groups on adherence to GP's advice or anxiety.
Lobb et al., 2002 (Australia)	RCT; participants randomly assigned to an intervention group (n= 98) or a control group (n= 95). Familial cancer clinics (N=10).	N= 193 Diagnosis: High risk breast cancer families Mean age: 44 years (control), 45 years (intervention) Gender: all female	CR of initial genetic counseling appointment	**Psychological measures** Tools: Impact of Events Scale, Hospital Anxiety and Depression Scale, and the Monitoring-Blunting Style Scale **Risk perception** Tool: perceived risk was assessed by asking the women to choose between seven possible responses **Satisfaction with the genetic counseling session and with the information received** Tool: Satisfaction with Genetic Counseling Scale **Satisfaction with audiotape** Tool: Satisfaction with audiotape questions adapted from another study **Use of the audiotape**	Significant differences between groups on anxiety and depression when the analysis was repeated with those women who had listened to the tape. Unaffected women in the intervention group were significantly less likely to be accurate in their risk perception. No statistically significant differences between groups on satisfaction with the genetic counseling session or breast cancer information received. The majority of women who listened to the tape found it helpful, 20% found it satisfactory, and 35% found it very or extremely helpful. 51% listened to the tape. 31% of women listened to the audiotape once, 16% listened to it twice, and 3% listened to it three times.

				Breast Cancer Knowledge Tool: Breast Cancer Knowledge Scale	
Mishra et al., 2010 (United Kingdom)	RCT; participants randomly assigned to three groups: a control group (n=29), a generic tape group which received a standardized tape about the surgery (n=25), or a consultation group (n=30) who received a tape of their consultation interview. Tertiary health care center.	N= 84 Diagnosis: elective first-time coronary artery surgery Mean age: 67 years (control & generic tape group), 66 years (CR group) Gender: 60 males and 24 females	CR of an outpatient consultation on informed consent for cardiac surgery	**Knowledge** Tool: Knowledge Questionnaire **Locus of Control** Tool: Multidimensional Health Locus of Control Questionnaire **Anxiety and Depression** Tool: Hospital Anxiety and Depression Scale	The CR group had significantly higher mean knowledge, greater locus of control, and less anxiety and depression.
Stephens et al., 2008 (United Kingdom)	RCT; participants randomly assigned to an intervention group (n= 31) or a control group (n= 27). Practice of a surgeon specializing in upper gastrointestinal surgery.	N= 58 Diagnosis: esophageal or gastric cancer Median age: 69 years (control) & 66 years (intervention) Gender: male: female ratio; 22:9 (intervention) and 21:6 (control)	CR of a consultation in which a new diagnosis of esophageal or gastric cancer was given	**Information retention** Tool: structured interview **Psychological outcome** Tool: Hospital Anxiety and Depression Questionnaire **Socio-economic deprivation** Tool: National Indices of Multiple Deprivation **Attitudes to tape and consultation** Tool: questionnaire regarding attitude to tape	Participants in the intervention group retained significantly more information about their diagnoses and treatment. No significant differences between groups on psychological outcomes. Deprivation correlated with higher HAD anxiety scores for the control group but not for the intervention group, and was not associated with information retention. 90% of the intervention group participants found the tape helpful. 29 of the 31 intervention group participants listened to the tape. Patients listened to the tape a median of 1 time (0-10 times range).

Uitdehaag et al., 2012 (The Netherlands)	RCT; participants randomly assigned to a CD group (n=10) or a no-CD group (n=7). Practice of 2 gastroenterologists, 3 otolaryngologists, and 3 surgeons (N=8 sites).	N= 17 Diagnosis: incurable or recurrent oesophageal or head and neck cancer Mean age: 68years (intervention), 62years (control) Gender: 12 males and 5 females	CR of patients being told of new diagnosis and decision to move to palliative care	**Quality of Life** Tools: EORTC QLQ-C15-PAL **Openness to discussing cancer-related issues in the family** Tool: Openness to Discuss Cancer in the Family Scale **Feasibility** Tool: researcher developed questionnaire **Use of CD** Tool: researcher developed questionnaire	No significant differences between groups on quality of life or openness to discussing cancer-related issues in the family. No major technical or procedural problems occurred. 71% appreciated receiving the CR. 80% listened to the CR.
Good et al., 2016 (United Kingdom)	Quasi-experiment; participants assigned to an audio recording group (n=40) or a control group (n=27). Prostate cancer clinic of one urologist.	N= 67 Diagnosis: prostate cancer Mean age: 63.5years (control), 64.4years (intervention) Gender: all male Race/ethnicity: 96.3% Caucasian (control group); 97.5% Caucasian (intervention group)	CR of the consultation where diagnosis and management of prostate cancer were discussed	**Quality of life** Tools: EORTC QLQ-C30/PR 25 **Decision regret** Tool: Decision Regret Scale Questionnaire **Patient satisfaction with CR** Patient satisfaction questionnaire developed by researchers; included open-ended questions	Non-significant trend towards better global health score in the CR group. The CR group had significantly different (lower) bowel symptoms. Decision regret was significantly lower in the intervention group. In the QE study, receiving a CR was positively associated with less decision regret, and was even a stronger predictor than erectile dysfunction or incontinence. The mean score for usefulness was 1.8 on a 1-5 scale with 1 being very useful. The average amount of times patients listened to the CR was 3.

Characteristics of Cross-sectional Descriptive Studies				
Study	Study Design and Setting	Sample Characteristics	Consultation Recording	Results:
Belkora et al., 2015 (United States)	Cross-sectional descriptive study. The multidisciplinary Breast Care Center at the University of California.	N=1812 Diagnosis: breast cancer	CR of new patients' consultations with a breast care center specialist	60% listened to the CR, 41% shared the CR with another person, and 84% would recommend CR.
Bowden et al., 2003 (United Kingdom)	Cross-sectional descriptive study. A multidisciplinary head and neck oncology clinic.	N=50 patients Diagnosis: head and neck cancer Mean age: 66 years Gender: 24 males and 26 females	CR of new and returning patients' consultations	36 (92%) found CR useful and beneficial (30/33 of the review patients, and all 6 new patients). 88% of the review patients and 100% of the new patients listened to the tape either by themselves or with another person.
Bozic et al., 2014 (USA)	Mixed methods study with a cross-sectional descriptive component. Orthopedic practice.	N= 26 patients, 518 surgeons, and 6 employer members Diagnosis: hip or knee arthritis	Evaluation of decision and communication aids, one of which was consultation recordings	The most frequently reported benefit of CR was that it enabled the patient to review/access the consultation information (58%). 80% (19/24) of the patients reported that they would want to receive a CR of future consultations. Regarding surgeons perceptions of communication aids, 68% believed that they would improve patient satisfaction and 56% believed that CR would improve the quality of the physician-patient interaction.
Hack et al., 2013 (Canada)	Mixed methods study with a cross-sectional descriptive component. Tertiary oncology centres (N=3 sites).	N=228 patients Diagnosis: breast or prostate cancer Age: 59.8 years (SD, 15.3) Gender: 54 males and 174 females	CR of an initial postsurgical breast adjuvant treatment consultation or an initial, post-diagnostic prostate treatment consultation with an oncologist	Patients rated CR highly with 93.6% rating it between 75 and 100 out of 100, and an average rating of 93.8 (S.D. = 13.7). 68.9% of the participants listened to a portion of the CR within one week of the consultation. Patients listened to the complete recording an average of 2.0 (S.D. = 1.8) times and a portion of the recording an average of 21.7 times (SD=1.3). 58.6% of the patients shared the CR with another person with the average number of other persons being 0.8 (S.D.= 0.5).

Haslop, 2005 (United Kingdom)	Cross-sectional descriptive study. Thoracic Oncology Service, Papworth Hospital	N= 57 patients, 17 staff Diagnosis: lung cancer and other diagnoses	CR of patient consultation at a joint physician and oncologist clinic	39 (98%) reported that CR was beneficial, 89% reported that they would have future consultations recorded, and 95% said they would recommend it to others. 70% (n=40) of the patients listened to the CR, and 60% listened to the CR with a family member and one listened to it with their GP.
Knox et al., 2002 (Australia)	Cross-sectional descriptive study. Oncology outpatient appointment with one oncologist.	N= 52 patients Diagnosis: cancer Mean age: 51 years Gender: 39 females and 13 males	CR of routine follow-up oncology consultations	77% thought that the CR was useful and 86.7% listened to the CR. 26 patients listened to the CR, and 14 listened more than once. 46.5% shared the CR with another person. 57% of patients preferred to receive both the tape and letter, three preferred the tape, and seven preferred the letter. Significant predictors of wanting to keep the audiotape included being married, receiving bad news, and longer consultations.
Lipson-Smith et al., 2016 (Australia)	Cross-sectional descriptive study. Cancer hospital.	N=23, and 16 received the intervention Diagnosis: cancer Mean age: 66 years (SD, 8.6) Gender: 14 males, 9 females Language: Arabic 4.4%, Cantonese 21.7%, Greek 30.4%, or Mandarin 43.5%	Mixed intervention including cancer information sheets, a question prompt list, and CR of an oncology consultation	77% found the CR useful for helping with recall and understanding, making the doctor more attentive, and helping the family. 81% listened to the CR, with 31% listening more than once. 77% stated that family members also listened.
Masera et al., 2003 (Italy)	Cross sectional descriptive study and quality improvement project.	N= 49 sets of parents Diagnosis: leukemia Mean age of children: 5.2 years Gender of children: 35 males, 28 females	CR of initial consultation when the leukemia diagnosis, program of care, and prognosis were discussed	89% of the participants reported that they were happy to receive the CR, and 82.9% of the couples thought that the CR helped them to understand the information. Most participants (87.8%) recommended that the tape would be helpful for future families. 81.6% of the participants listened to it. Participants listened to the tape an average of 2.9 times, with a range of 1-12 times.
Purbick et al., 2006 (United Kingdom)	Cross-sectional descriptive study. Tertiary adult ocular	N= 39 patients Mean age: 63 years Gender: 12 males and 27 females	Patients provided with a CR of their consultation	74.3% of the participants rated CR as being extremely useful, 80% reported listening to it. The participants used it an average of 2.2 times and it was the most popular resource provided by the oncology centre.

	oncology centre.			
Seider et al., 2015 (USA)	Cross sectional descriptive study. Ocular Oncology Clinic, University of California.	N=13 patients Diagnosis: indeterminate or malignant ocular tumors Mean age: 56.6 years Gender: 4 males and 9 females	CR of initial consultation with an ocular oncologist	Patients found that the consultation recording was useful for understanding their diagnosis (85% very useful and 15% somewhat useful), understanding their prognosis (77% very useful and 23% somewhat useful), and understanding their treatment options and possible side-effects (85% very useful and 15% somewhat useful). Of the 13 participants, five people listed to the CR once (38%), six people (46%) listened to the CR two to three times, and two people (15%) listened to it four to six times. 54% shared the recording with someone else.
Shepherd et al., 2009 (United Kingdom)	Mixed methods study with a cross-sectional descriptive component. A specialist treatment and research center specializing in cognitive behavioral therapy for anxiety disorders.	N= 72 patients at the start of therapy and 31 at the end of therapy; 15 therapists. Diagnosis: Of the 72 patients, 78% were being treated for social anxiety, 63% for OCD, 48% for panic disorder, and 24% for PTSD	CR of cognitive behavioral sessions	80% found the CR helpful, and 90% of patients listened to the CR between therapy sessions. All therapists rated the CR as helpful (100%). Patients listened to the CR at least once (50%), sometimes (23%), more than once (20%), and not at all (7%).
Volz et al., 2015 (USA)	Cross-sectional survey. University of California Breast Care Center.	N= 82 participants Diagnosis: breast cancer Mean age: 57 years Gender: all female Race/Ethnicity: 71% were White	CR of a consultation with a breast cancer specialist	Only 20% (16/79) of patients who were prompted to make recordings did so when prompted. 53% of those who made recordings listened to it, and 40% shared it with someone else.
Wolderslund et al., 2015 (Denmark)	Cross-sectional descriptive study. Danish Regional Hospital (N= 4	N= 2784 (654 pediatric, 704 orthopedic, 737 internal medicine and 689 urological patients) Median age (years): 9	CRs of consultations.	31% of the patients listened to the CR within 90 days of the consultation, and 19 individuals at a later date. 33.3% replayed more than once. Male patients and their relatives had a lower probability of listening to the CR together compared with female patients and their

	outpatient clinics: pediatrics, urology, orthopedics, and internal medicine.	(pediatric), 64 (orthopaedic), 60 (internal medicine), and 69 (urological) Gender (male): 55.7% (pediatric), 42.9% (orthopaedic), 44.2% (internal medicine), and 81.9% (urological)		relatives. Relatives of male patients had a higher probability of listening to the CR on their own compared with female patients' relatives.

Characteristics of Qualitative Studies

Study	Study Design and Setting	Participants	Study Focus
Belkora et al., 2008 (USA)	Mixed methods study with a qualitative component; data included semi-structured interviews; data analysis not specified. Consultations with breast cancer patients making treatment decisions at a breast care center.	Surgeons (5) and oncologists (9) who held consultations; schedulers and premedical staff interns (14) who facilitated the complex intervention.	Experiences of the implementation of consultation planning, recording, and summarizing
Belkora et al., 2009 (USA)	Individual case study; data included program records, qualitative survey data, and a semi-structured interview; data analysis not specified. Consultation with a breast cancer patient making treatment decisions at a breast care center.	A 36 year old with stage 1 breast cancer.	Experiences of decision support systems which included CR
Bozic et al., 2014 (USA)	Mixed methods study with a qualitative component; data included open-ended survey responses, in-depth telephone interviews, and field notes; thematic data analysis. Orthopedic practice.	Patients with hip or knee arthritis, orthopedic surgeons, and healthcare purchasers. Patients (n=26) were surveyed. Of these participants, 13 completed a telephone interview.	Experiences of decision and communication aids, one of which was consultation recordings
Elwyn et al., (2015) (United Kingdom)	Mixed methods study with a qualitative component; data included semi-structured interviews; thematic data analysis. Radio listeners.	17 online survey respondents who also participated in a semi-structured interview.	Motivation for patients' self-recording their clinical encounters (covertly or otherwise)
Good et al., 2016 (United Kingdom)	Quasi-experiment with a qualitative component; data included open-ended questions on a questionnaire; thematic data analysis. Prostate cancer clinic of one urologist.	Male patients (N=40) undergoing management of prostate cancer in the UK.	Experiences of receiving a consultation recording

Hack et al., 2013 (Canada)	Mixed methods with a qualitative component; data included semi-structured interviews and focus groups; content analysis. Tertiary care oncology centers.	228 patients who had been newly diagnosed with breast (n=174) or prostate (n=54) cancer; 32 patients participated in the focus groups; oncologists.	Experiences of consultation recording and of implementing consultation recording
Hacking et al., 2014 (USA)	Qualitative study; data included semi-structured telephone interviews with patients and semi-structured face-to-face interviews with doctors; data analysis consisted of framework analysis with a priori themes and constant comparison.	Men with prostate cancer (n=6) who received decision navigation and doctors (n=4) who consulted with the patients.	Experiences of consultations using Decision Navigation, which included consultation recording
Jackson et al., 2007 (United Kingdom)	Qualitative study; data included semi-structured telephone interviews; thematic data analysis. Inner-city medical center in a community with a high proportion of Somali residents.	58 Somali patients having a general practice consultation who needed an interpreter to accompany them.	Experiences of receiving personalized audio information from the consultation provided in one's own language.
Leahy et al., 2005 (United Kingdom)	Mixed methods study with a qualitative component; data included semi-structured interviews; content analysis. Patients having a heart surgery consultation.	19 patients who had a heart surgery consultation (10 received a recording and 9 did not)	Experiences of audiotaping the heart surgery consultation
Moloczij et al. (2016) (Australia)	Interpretive description; data included semi-structured interviews; thematic descriptive analysis. Metropolitan oncology departments.	20 participants which included 13 doctors and 7 hospital administrators.	Implementing CR and question prompt lists into usual care
Pass et al., 2012 (USA)	Qualitative study; data included case notes written about each patient; modified grounded theory data analysis. Breast care center.	10 staff interns at a breast cancer clinic.	Experiences of physician engagement in the implementation of decision and communication aids (including CR)
Shepherd et al., 2009 (United Kingdom)	Mixed methods study with a qualitative component; data included a questionnaire with open-ended questions; thematic data analysis. A treatment and research center specializing in cognitive behavioral therapy for anxiety disorders.	Patients (72 at the start of therapy and 31 at the end of therapy) and 15 therapists	Experiences of audio-recording cognitive behavioral sessions

AMSTAR – a measurement tool to assess the methodological quality of systematic reviews.

1. Was an 'a priori' design provided?
The research question and inclusion criteria should be established before the conduct of the review.

Note: Need to refer to a protocol, ethics approval, or pre-determined/a priori published research objectives to score a "yes."

- ☑ Yes
- ☐ No
- ☐ Can't answer
- ☐ Not applicable

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2. Was there duplicate study selection and data extraction?
There should be at least two independent data extractors and a consensus procedure for disagreements should be in place.

Note: 2 people do study selection, 2 people do data extraction, consensus process or one person checks the other's work.

- ☑ Yes
- ☐ No
- ☐ Can't answer
- ☐ Not applicable

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3. Was a comprehensive literature search performed?
At least two electronic sources should be searched. The report must include years and databases used (e.g., Central, EMBASE, and MEDLINE). Key words and/or MESH terms must be stated and where feasible the search strategy should be provided. All searches should be supplemented by consulting current contents, reviews, textbooks, specialized registers, or experts in the particular field of study, and by reviewing the references in the studies found.

Note: If at least 2 sources + one supplementary strategy used, select "yes" (Cochrane register/Central counts as 2 sources; a grey literature search counts as supplementary).

- ☑ Yes
- ☐ No
- ☐ Can't answer
- ☐ Not applicable

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4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?
The authors should state that they searched for reports regardless of their publication type. The authors should state whether or not they excluded any reports (from the systematic review), based on their publication status, language etc.

Note: If review indicates that there was a search for "grey literature" or "unpublished literature," indicate "yes." SIGLE database, dissertations, conference proceedings, and trial registries are all considered grey for this purpose. If searching a source that contains both grey and non-grey, must specify that they were searching for grey/unpublished lit.

- ☑ Yes
- ☐ No
- ☐ Can't answer
- ☐ Not applicable

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5. Was a list of studies (included and excluded) provided?
A list of included and excluded studies should be provided.

Note: Acceptable if the excluded studies are referenced. If there is an electronic link to the list but the link is dead, select "no."

- ☑ Yes
- ☐ No
- ☐ Can't answer
- ☐ Not applicable

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6. Were the characteristics of the included studies provided?
In an aggregated form such as a table, data from the original studies should be provided on the participants, interventions and outcomes. The ranges of characteristics in all the studies analyzed e.g., age, race, sex, relevant socioeconomic data, disease status, duration, severity, or other diseases should be reported.

Note: Acceptable if not in table format as long as they are described as above.

- ☑ Yes
- ☐ No
- ☐ Can't answer
- ☐ Not applicable

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7. Was the scientific quality of the included studies assessed and documented?
'A priori' methods of assessment should be provided (e.g., for effectiveness studies if the author(s) chose to include only randomized, double-blind, placebo controlled studies, or allocation concealment as inclusion criteria); for other types of studies alternative items will be relevant.

Note: Can include use of a quality scoring tool or checklist, e.g., Jadad scale, risk of bias, sensitivity analysis, etc., or a description of quality items, with some kind of result for EACH study ("low" or "high" is fine, as long as it is clear which studies scored "low" and which scored "high"; a summary score/range for all studies is not acceptable).

☑ Yes
□ No
□ Can't answer
□ Not applicable

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8. Was the scientific quality of the included studies used appropriately in formulating conclusions?
The results of the methodological rigor and scientific quality should be considered in the analysis and the conclusions of the review, and explicitly stated in formulating recommendations.

Note: Might say something such as "the results should be interpreted with caution due to poor quality of included studies." Cannot score "yes" for this question if scored "no" for question 7.

☑ Yes
□ No
□ Can't answer
□ Not applicable

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9. Were the methods used to combine the findings of studies appropriate?
For the pooled results, a test should be done to ensure the studies were combinable, to assess their homogeneity (i.e., Chi-squared test for homogeneity, I^2). If heterogeneity exists a random effects model should be used and/or the clinical appropriateness of combining should be taken into consideration (i.e., is it sensible to combine?).

Note: Indicate "yes" if they mention or describe heterogeneity, i.e., if they explain that they cannot pool because of heterogeneity/variability between interventions.

☑ Yes
□ No
□ Can't answer
□ Not applicable

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10. Was the likelihood of publication bias assessed?
An assessment of publication bias should include a combination of graphical aids (e.g., funnel plot, other available tests) and/or statistical tests (e.g., Egger regression test, Hedges-Olken).

Note: If no test values or funnel plot included, score "no". Score "yes" if mentions that publication bias could not be assessed because there were fewer than 10 included studies.

□ Yes
☑ No
□ Can't answer
□ Not applicable

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11. Was the conflict of interest included?
Potential sources of support should be clearly acknowledged in both the systematic review and the included studies.

Note: To get a "yes," must indicate source of funding or support for the systematic review AND for each of the included studies.

☑ Yes
□ No
□ Can't answer
□ Not applicable

Shea *et al. BMC Medical Research Methodology* 2007 **7**:10 doi:10.1186/1471-2288-7-10

Additional notes (in italics) made by Michelle Weir, Julia Worswick, and Carolyn Wayne based on conversations with Bev Shea and/or Jeremy Grimshaw in June and October 2008 and July and September 2010.